

Forest First Aid

What is a Healthy Forest?
The ideal setting for a ponderosa forest is a mosaic of open areas interspersed with stands of multi-aged trees and mature trees scattered widely about. A fire in a ponderosa pine forest can be good or bad depending on the amount of available fuel. The more the fuel, the hotter the fire. The hotter the fire, the worse it is.

Picture a lightning strike in a healthy forest. The impact occurs at the top of an old snag and spirals down the trunk into the ground where a clump of grass begins to burn. Without a lot of duff or dead wood around, the fire is left to smolder in the underbrush, never receiving enough fuel to grow. This fire could smolder for days, slowly moving along the undergrowth burning the grasses and whatever duff and litter that has accumulated. Burning breaks down this material and puts it back into the soil as nutrients because the fire has not gained enough heat to be damaging. The same lightning strike in a too dense forest would begin the same way but would have more fuel to burn and would quickly grow, climbing the ladder fuels (undernourished grasses and shrubs and undersized trees) until it becomes a crown fire.

An overgrown forest (top right), resulting mainly from our 100-year practice of preventing forest fires, has

- a forest floor with dead wood and a thick duff layer,
- ladder fuels,
- no sunlight penetration,
- no wildlife, and
- an upper forest canopy so crowded that the crowns of all the trees are touching.

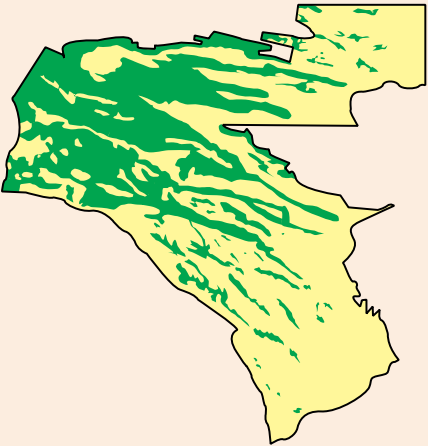
On the other hand, a healthy forest (middle right) has

- around 150 mature trees per acre,
- life-giving sunlight,
- grass meadows with shrubs,
- wildlife, and
- no threat of crown fires.

What is a Crown Fire?
Crown fires (bottom right) occur when the trees are all close enough together that the tops of the trees all touch. A fire that gets to the top of the trees can then spread unimpeded by any human efforts to contain it and reach scorching temperatures. Unlike mild ground fires, crown fires create temperatures so high that all the nutrients above and below the ground are completely destroyed, leaving behind a black, barren landscape and creating conditions for severe erosion that will not be overcome for hundreds of years.



How Patrick Valerio Helps—Thinning overgrown forests is necessary to help return them to optimum conditions. Patrick and others go into a forested area—possibly an area that Randy and his crew have labeled as high risk—and mark trees for removal. They look for overcrowded trees or trees that are physically damaged, perhaps diseased. Crews from the US Forest Service and Johnson Controls Northern New Mexico then go through the area and cut down the marked trees, making large piles of wood for the public to take home. Whatever is left over—the stuff that is too small to carry home, called slash—is ground up into mulch. The mulch is also available to the public. By the end of summer 1999, 350 acres of ponderosa pine forest will have been thinned.



Mixed Conifer and Ponderosa on the Laboratory— Roughly one-third of Laboratory grounds consists of ponderosa and mixed conifers (shown in green on the map). The forest within half-a-mile along State Road 501 from the Wellness Center to the back gate has been thinned. Thinning efforts are also taking place along power line corridors and at other sites throughout Laboratory property.



How Randy Balice Helps—He works with a crew to develop a base line estimate of fuel levels in a variety of environmental locations on Laboratory and US Forest Service land to evaluate hazards from wildfire. Randy's crew has discovered that mixed conifer forests in both canyons and mountains are the densest (more foliage per acre) and ponderosa pine forests on mesas also have the overstory vegetation density comparable to mixed conifer density. The densities of both forest types are way above the norm.

Know Fuel, Know Fire

We all understand the importance—and danger—of fire. Since prehistoric times when the ancient ancestors of today’s Puebloans lived here on the Pajarito Plateau, we have needed fire to heat our homes and cook our food. Today, as before, we still enjoy a good fire in the fireplace on cold wintry nights or a blazing campfire on a beautiful summer night.

But we also know to be careful, because in the wrong circumstances, fire can become a frightening and destructive force. For northern New Mexicans, this understanding is fresh with examples—memories of the Dome, Oso, and Hondo fires. Furthermore, we are very aware of the

unusually low level of precipitation these past few years and the resulting seasonal dryness of our forests.

A fire capable of great destruction requires only a simple recipe: ignition, heat, and fuel. Take away any one of these ingredients and a fire cannot happen. Wildfire experts like Randy Balice and Patrick Valerio at the Laboratory understand the workings of this basic recipe in a forest setting. Says Randy, “Of the three components of fire, we can’t control two. To prevent fire, we can only do something about one component—the amount of forest fuel available—to avoid catastrophe.”

Patrick says, “We’ve a serious problem with overgrown ponderosa pine forest, not only within Laboratory boundaries, of which roughly one-third is ponderosa, but throughout the entire Pajarito Plateau. Where 150 mature trees per acre is an ideal situation, our forests range from 400 to 1000 trees per acre. We’ve begun various projects around the Laboratory to deal with this problem.”

Randy and Patrick know that proper management, as described in the next two pages can restore the ponderosa pine to a proper balance. A forest that contains far fewer trees per acre will reduce the amount of available fuel for any potential wildfire, rendering it controllable. Naturally, when fire is controllable, both the Laboratory and its surrounding communities are safer places to work and live.

Know Fuel, Know Fire



Patrick Valerio—Wildland Fire Behavior Specialist/Forester

As with most native northern New Mexicans, Patrick Valerio appreciates the natural beauty of New Mexico. With one of the nation’s lowest populations per square mile—and many, many square miles—New Mexico has large expanses of pure nature. Of course, Patrick is partial to the scenery closer to home in the north, where the bottomland of the Rio Grande drainage basin rises to the heights of the Sierra de los Valles. Numerous ecosystems exist in between. The variety of the landscape and the extended panorama provide ever-changing scenery—even down a road that is completely familiar.

Growing up in farming and ranching—a third generation New Mexican—Pat knows about working with the land and about a commitment to stewardship of that land. His course in life has led him to protecting wildlands, beginning as an ecologist and continuing for 18 years. He is certified as a Prescribed Burn Boss II and has helped with wildland restoration of over 35,000 acres, not only in his home state but also in Colorado, Wyoming, and South Dakota. Today, Patrick works at the Laboratory as a Wildland Fire Behavior Specialist/Forester and is heavily involved with planning and implementing forest management at the Laboratory.